## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims

1.    (Previously presented) A semiconductor chip pick-up method for picking up a semiconductor chip adhered to a sheet by using a pick-up head, comprising:

a sheet exfoliating step for abutting a suction surface of a sheet exfoliation mechanism against a lower surface of the sheet and for performing vacuum-sucking through the suction surface thereby to exfoliate the sheet from the semiconductor chip; and

a sucking and holding step of sucking and holding an upper surface of the semiconductor chip thus exfoliated from the sheet by the pick-up head thereby to pick up the semiconductor chip, wherein

in the sheet exfoliating step, when the vacuum-sucking is performed through the suction surface, the semiconductor chip adhered to the sheet is bent and deformed by a vacuum suction force in an almost same bent shape in a continuous bent range from an outer peripheral portion of one side of the chip to an outer peripheral portion of another one side of the chip thereby to exfoliate the sheet from a lower surface of the semiconductor chip using due to the bend deformation only the vacuum suction force,

wherein the semiconductor chip is configured in a rectangular shape, and the bent range is set in a direction which forms a predetermined angle with respect to one side of the semiconductor chip,

wherein the bent range includes a corner portion of the semiconductor chip,

wherein the predetermined angle is about 45 degrees; and

wherein when the vacuum-sucking is performed, the sheet together with the semiconductor chip is bent toward a source of the vacuum suction from a flat plane in which the sheet is abutted against the suction surface of the exfoliation mechanism.

2.      (Original) A semiconductor chip pick-up method according to claim 1, wherein the semiconductor chip bends and deforms in a plurality of the bent ranges.

3-4.    (Canceled)

5.      (Currently amended) A semiconductor chip pick-up apparatus for picking up a semiconductor chip adhered to a sheet by using a pick-up head, comprising:

        a holding table for holding the sheet, and

        a sheet exfoliation mechanism which is disposed beneath the holding table, a suction surface of the sheet exfoliation mechanism being abutted against a lower surface of the sheet to perform vacuum sucking through the suction surface thereby to exfoliate the sheet from the semiconductor chip,

        wherein the suction surface includes a plurality of suction grooves and a boundary portion which partitions the adjacent suction grooves, the boundary portion is abutted against the lower surface of the sheet to support the sheet at a time of the vacuum sucking, and air is vacuum-sucked from the suction grooves to bend and deform the semiconductor chip adhered to the sheet together with the sheet thereby to exfoliate the sheet from a lower surface of the semiconductor chip due to the bend deformation using only a vacuum suction force,

        wherein the semiconductor chip is configured in a rectangular shape, and each of the suction grooves is provided in a direction which forms a predetermined angle with respect to one side of the rectangular-shaped semiconductor chip,

        wherein the suction grooves are arranged in a manner that corner portions of the semiconductor chip are not positioned just above the boundary portions when the suction surface is abutted against the lower surface of the sheet; and

wherein the boundary portion is arranged in a same flat plane as the suction surface so

that the sheet together with the semiconductor chip is bent toward a source of the vacuum

sucking from the flat plane,

wherein at least one of the plurality of suction grooves is linear and includes at least one

hole through a bottom surface of the suction groove, the at least one hole being in fluid

communication with the vacuum suction source.


6.      (Original) A semiconductor chip pick-up apparatus according to claim 5, wherein the

semiconductor chip is supported by the plurality of boundary portions through the sheet.


7-8.    (Cancelled)


9.      (Original) A semiconductor chip pick-up apparatus according to claim 5, wherein the

suction grooves are provided at a suction exfoliation tool, and the suction exfoliation tool is

attached to the sheet exfoliation mechanism so as to be exchanged freely.


10.     (Previously presented) A suction exfoliation tool for use in a semiconductor chip pick-up

apparatus for picking up a semiconductor chip adhered to a sheet by using a pick-up head,

comprising:

a suction exfoliation tool to be attached to a sheet exfoliation mechanism which has a

suction surface being abutted against a lower surface of the sheet to perform vacuum sucking

through the suction surface thereby to exfoliate the sheet from the semiconductor chip,

wherein the suction surface provided at the suction exfoliation tool includes a plurality of

suction grooves and a boundary portion which partitions the adjacent suction grooves, the

boundary portion is abutted against the lower surface of the sheet to support the sheet at a time of

the vacuum sucking, and air is vacuum-sucked from the suction grooves to bend and deform the

semiconductor chip adhered to the sheet together with the sheet thereby to exfoliate the sheet

from a lower surface of the semiconductor chip due to the bend deformation using only a

vacuum suction force,

wherein the semiconductor chip is configured in a rectangular shape, and each of the

suction grooves is provided in a direction which forms a predetermined angle with respect to one

side of the rectangular-shaped semiconductor chip,

wherein the suction grooves are arranged in a manner that corner portions of the

semiconductor chip are not positioned just above the boundary portions when the suction surface

is abutted against the lower surface of the sheet; and

wherein the boundary portion is arranged in a same flat plane as the suction surface so

that the sheet together with the semiconductor chip is bent toward a source of the vacuum

sucking from the flat plane.


11. (Previously presented) A semiconductor chip pick-up method for picking up a

semiconductor chip adhered to a sheet by using a pick-up head, comprising the steps of:

abutting a suction surface of a sheet exfoliation mechanism against a lower surface of the

sheet;

performing vacuum-sucking through the suction surface thereby to exfoliate the sheet

from the semiconductor chip, the semiconductor chip adhered to the sheet being bent and

deformed by a vacuum suction force in an almost same bent shape in a continuous bent range

from an outer peripheral portion of one side of the chip to an outer peripheral portion of another

one side of the chip thereby to exfoliate the sheet from a lower surface of the semiconductor chip

due to the bend deformation using only the vacuum suction force; and

picking up the semiconductor chip by sucking and holding an upper surface of the semiconductor chip by the pick-up head,

wherein the semiconductor chip is configured in a rectangular shape, and the bent range is set in a direction which forms a predetermined angle with respect to one side of the semiconductor chip,

wherein the bent range includes a corner portion of the semiconductor chip, and

wherein the predetermined angle is about 45 degrees,

wherein when the vacuum-sucking is performed, the sheet together with the semiconductor chip is bent toward a source of the vacuum suction from a flat plane in which the sheet is abutted against the suction surface of the exfoliation mechanism.

12.     (Cancelled)

13.     (Previously presented)          The semiconductor chip pick-up apparatus of claim 5 wherein each of the plurality of suction grooves is provided with a plurality of suction holes, through which the air is vacuum-sucked.

14-15. (Cancelled)

16.     (Previously presented) The semiconductor chip pick-up apparatus of claim 5 wherein the sheet exfoliation mechanism includes a main body portion, a supporting shaft portion, and a suction exfoliation tool, wherein the suction exfoliation tool is removably attached to the support shaft portion.